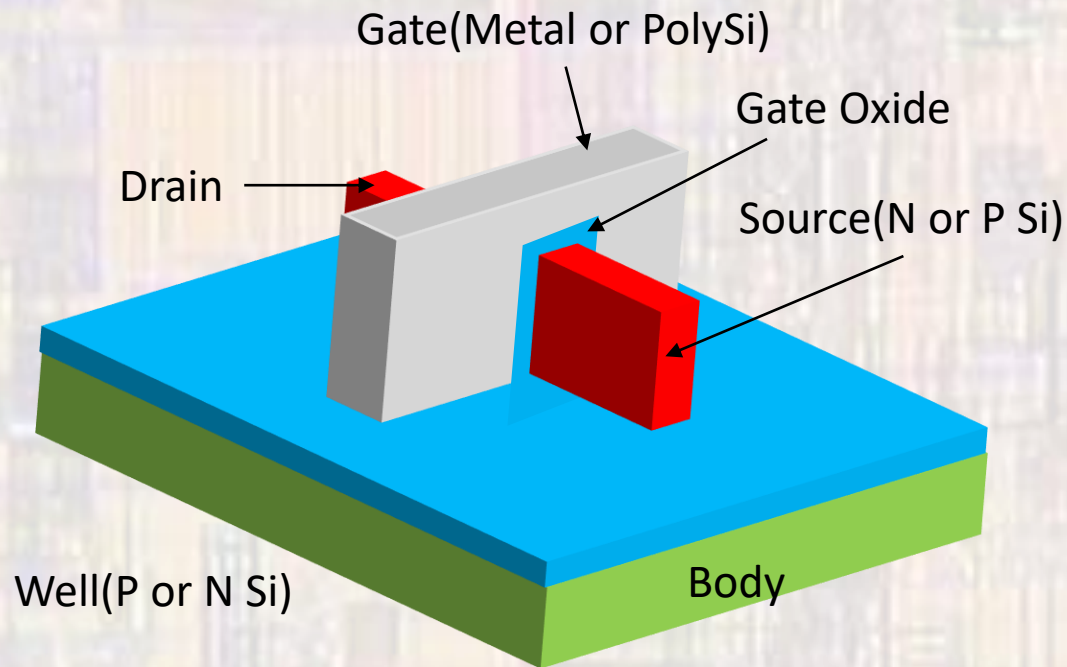
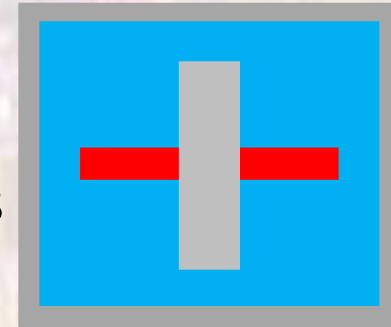


# FinFET Processing

Last updated 1/18/24

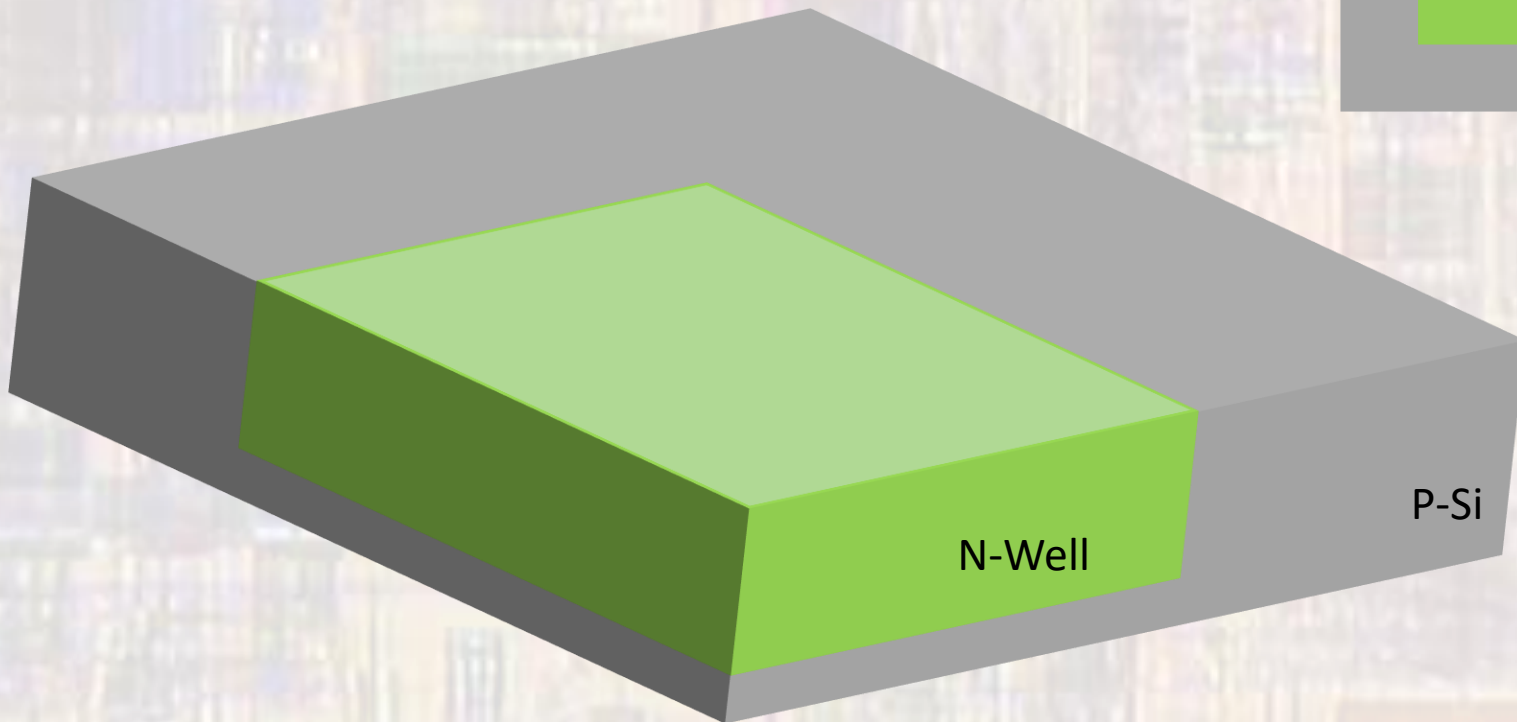
# FinFET Processing

- FinFET
  - Transistors are fin like structures
  - Dominant technology for large digital IC systems



# FinFET Processing

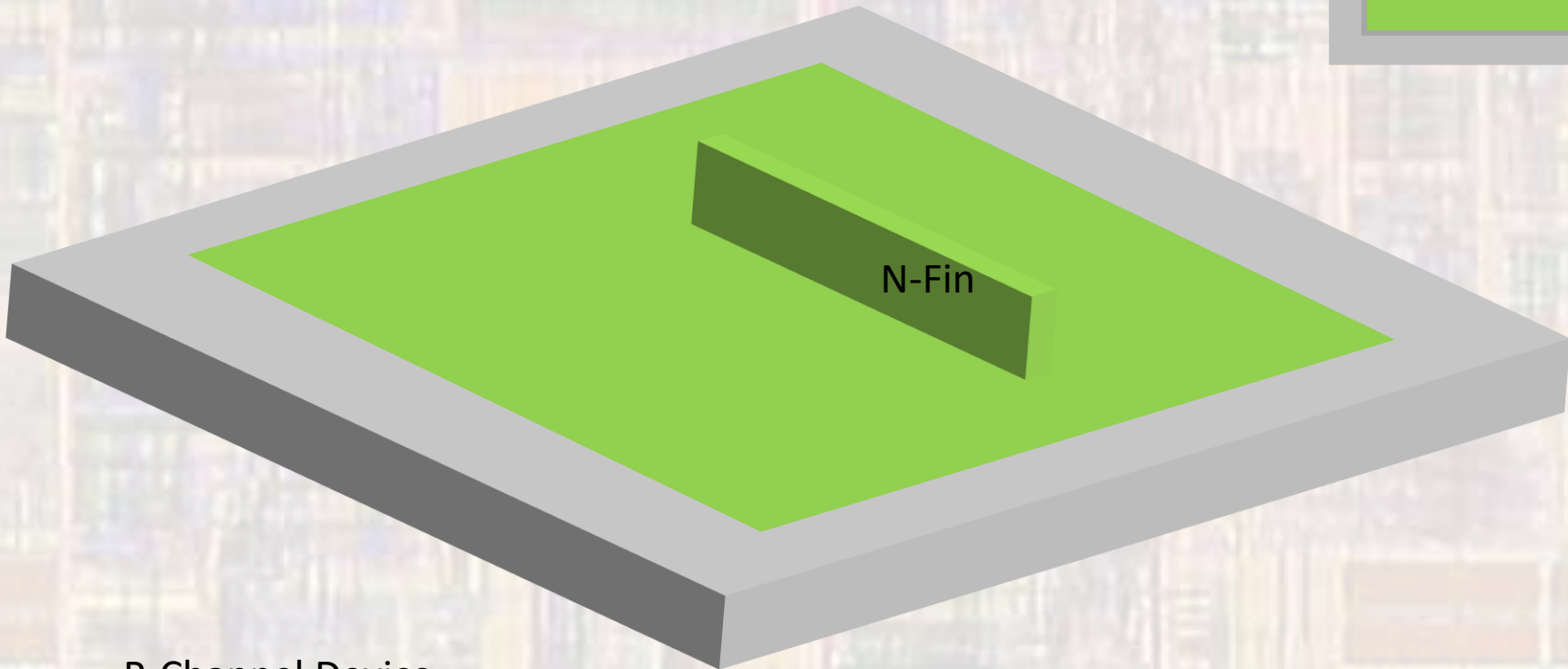
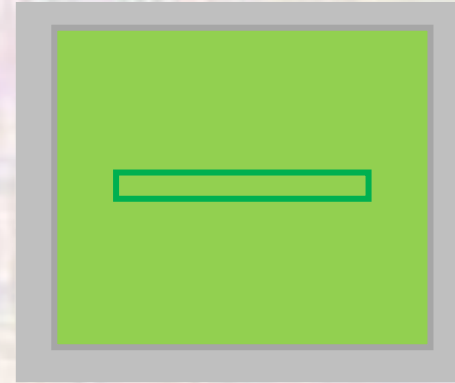
- Create N-Well (or P-Well) in the substrate
  - Ion Implantation



P-Channel Device

# FinFET Processing

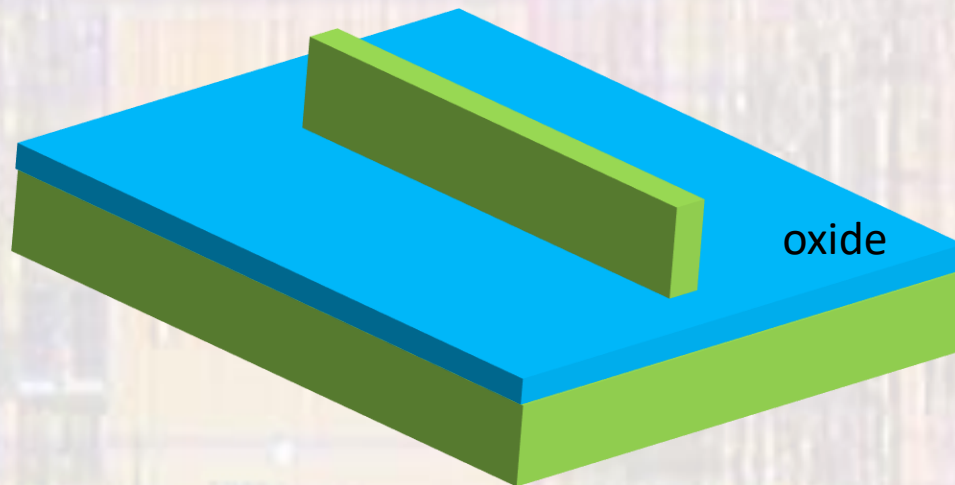
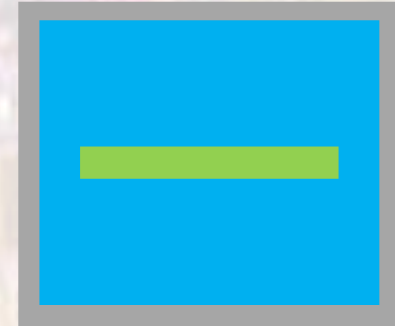
- Etch trenches into the well
  - Leaving only the Fins remaining



P-Channel Device

# FinFET Processing

- Deposit oxide
  - Cover everything with oxide (insulator)
  - Etch back oxide to desired fin height

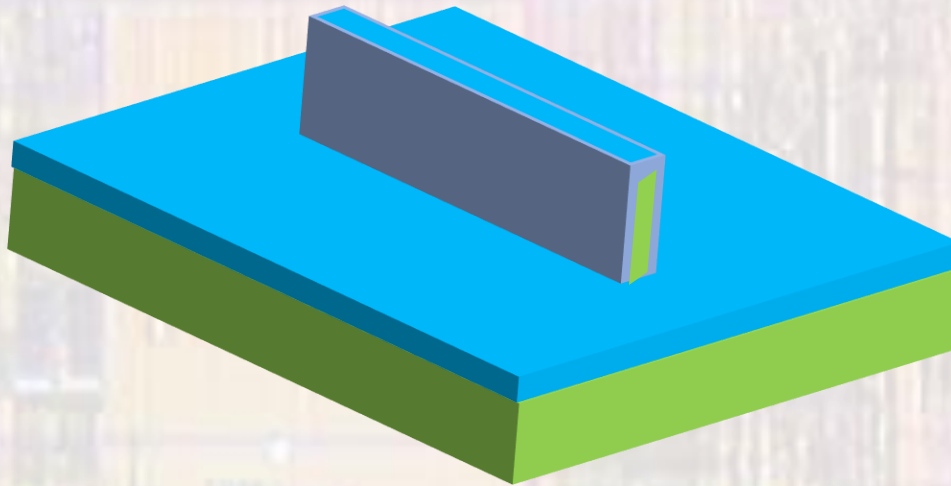
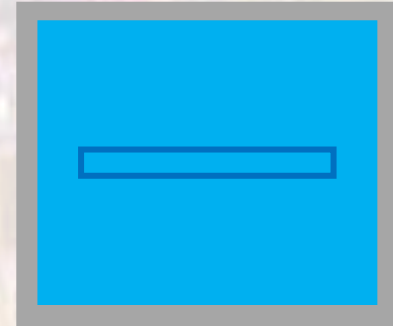


P-Channel Device



# FinFET Processing

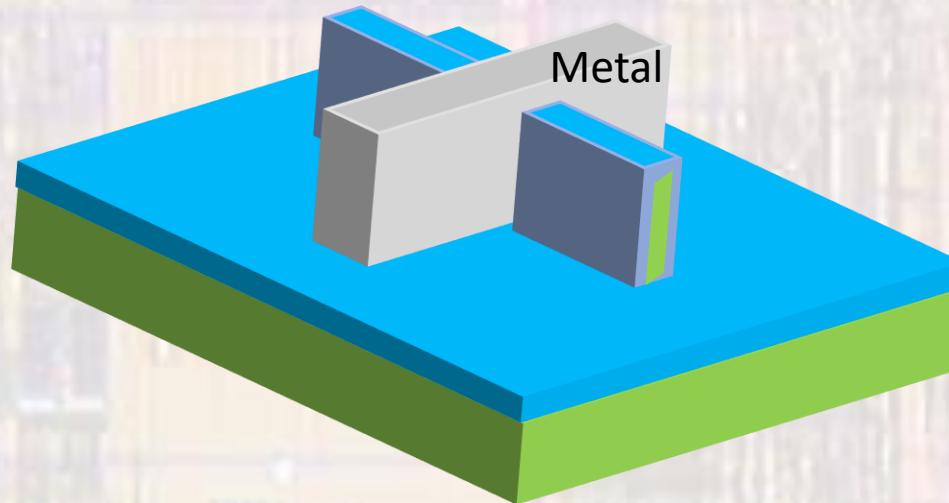
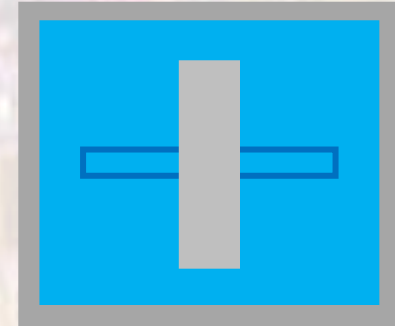
- Grow a thin layer of oxide everywhere
  - Gate Oxide



P-Channel Device

# FinFET Processing

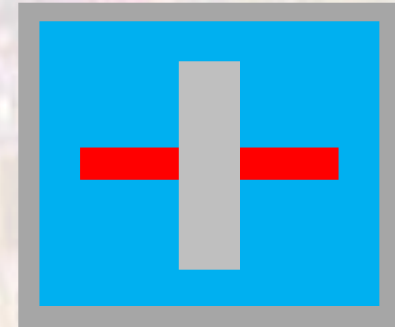
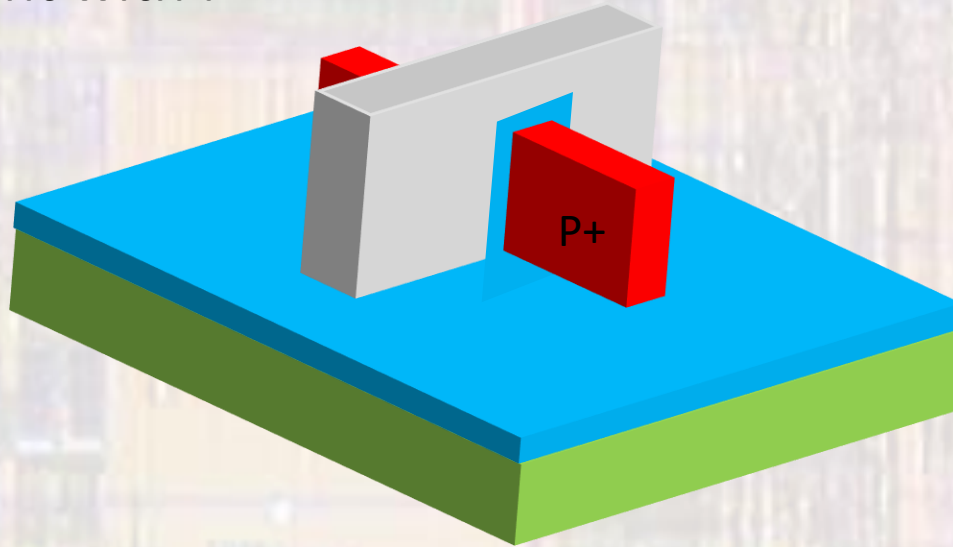
- Define the gate layer
  - Deposit Metal or Polysilicon and pattern



P-Channel Device

# FinFET Processing

- Define the Source/Drain
  - Strip the thin oxide
    - Gate oxide protected by the gate metal
  - Implant with P+

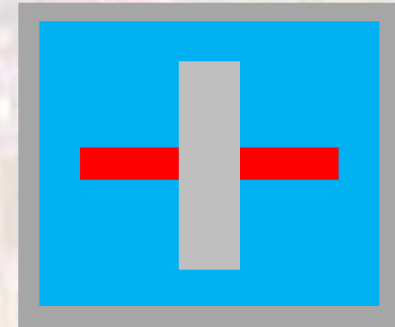
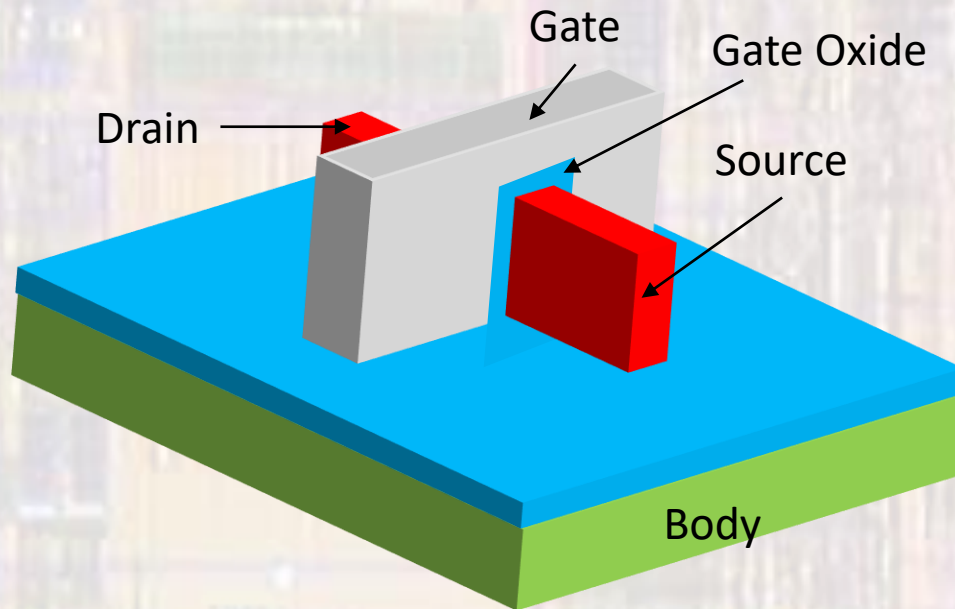


P-Channel Device



# FinFET Processing

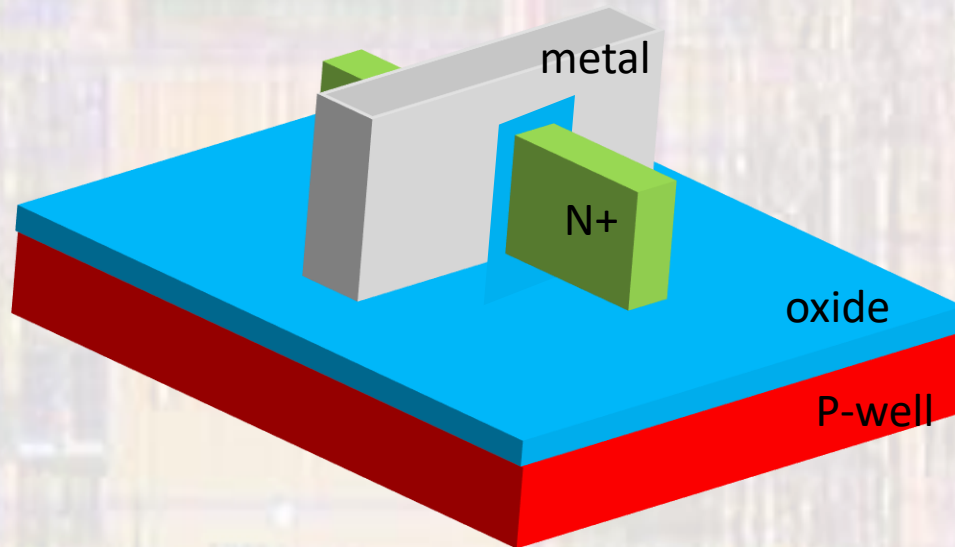
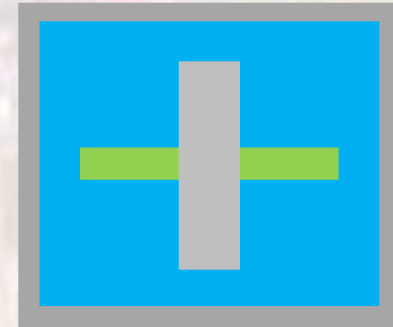
- Finished P-Channel Transistor



P-Channel Device

# FinFET Processing

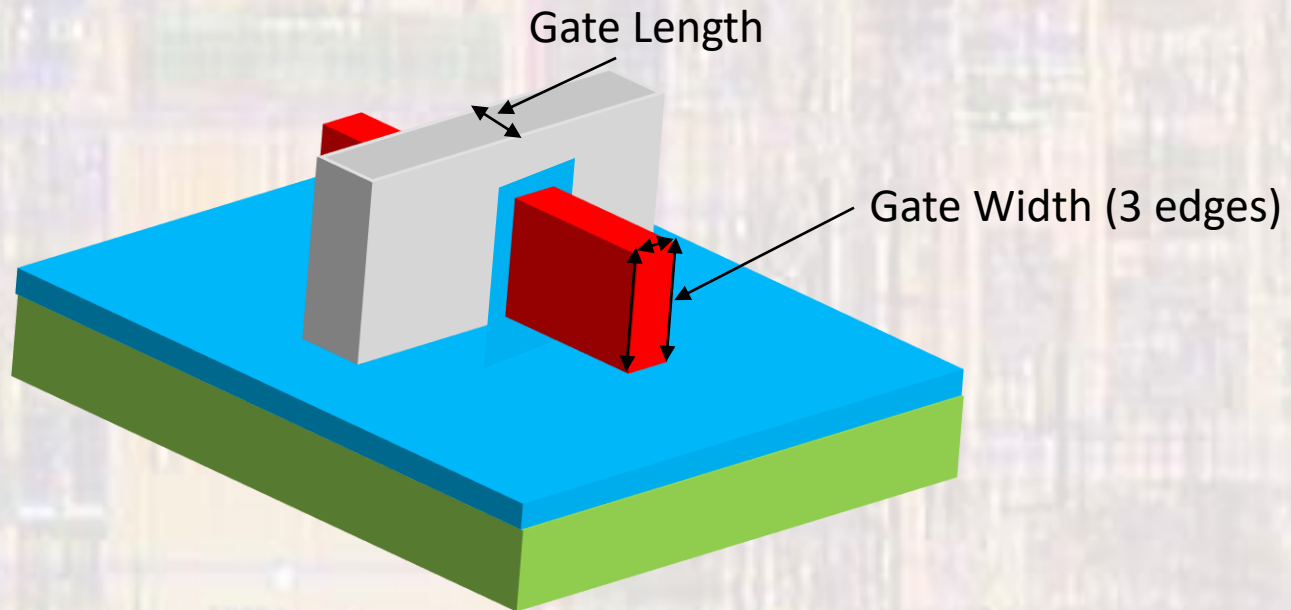
- Final N-channel Transistor
  - Uses the same processes



N-Channel Device

# FinFET Processing

- Design Dimensions
  - Gate Width and Gate Length are Fixed
    - Part of the process technology



- Device sizing is restricted to integral multiples of the standard size device