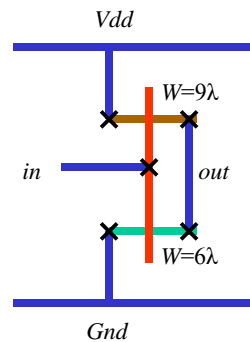# STICK DIAGRAMS

Stick Diagrams

- Dimensionless layout sketches
- Only topology is important
- Two primary uses
  - Useful intermediate step
    - Transistor schematic is the first step
    - Layout is the last step
  - Final layout generated automatically by "compaction" program
    - Not widely used; a topic of research
- Use colored pencils or pens whose colors match `magic` layer colors

Inverter Stick Diagram

- Diagram here uses magic standard color scheme
- Label all nodes
- Transistor widths (*W*) often shown—with varying units
  - Often in λ in this class
  - Also nm or μm
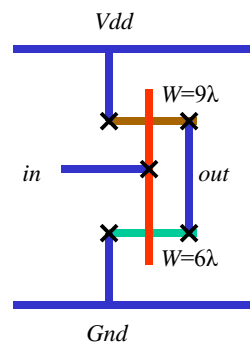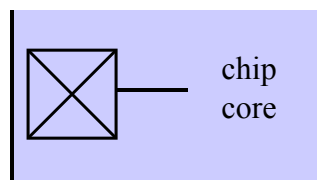 - Sometimes as a unit-less ratio—this stick diagram could also say the PMOS is 1.5x wider than the NMOS (saying "1" and "1.5" instead of "6λ" and "9λ"

Vdd

W=9λ

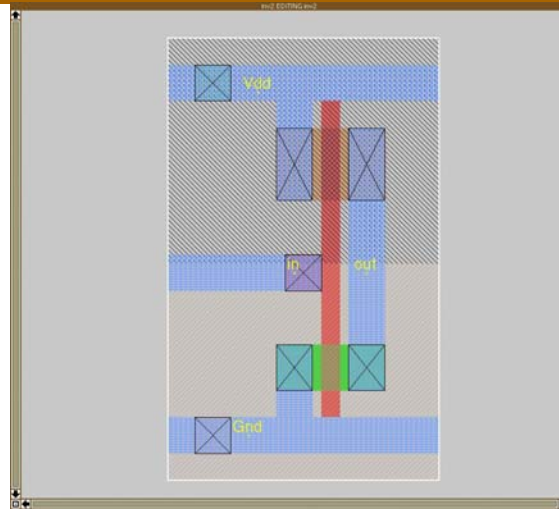*in*   *out*

W=6λ

Gnd

Stick Diagrams

- Can also draw contacts with an "X"
- Do not confuse this "X" with the chip I/O and power pads on the edge of chip shown with a box with an "X"

chip core

Vdd

W=9λ

in   *out*

W=6λ

Gnd

Magic Layout for the Inverter in the Stick Diagram

Source: Omar Sattari   70