

IC Lithography

Last updated 1/18/24

A faded, light-colored image of an integrated circuit (IC) die is visible in the background of the lower half of the slide. The die shows a complex grid of circuitry, including various rectangular blocks and lines, typical of a microchip layout.

IC Lithography

- Lithography
 - Process of making patterns on/in a material
 - Critical to Integrated Circuit processing
- Components
 - Patterned mask
 - Photo resist
 - Resist removal
 - IC processing technology

IC Lithography

- Cover the wafer with a photo-sensitive material
 - Positive or negative photoresist



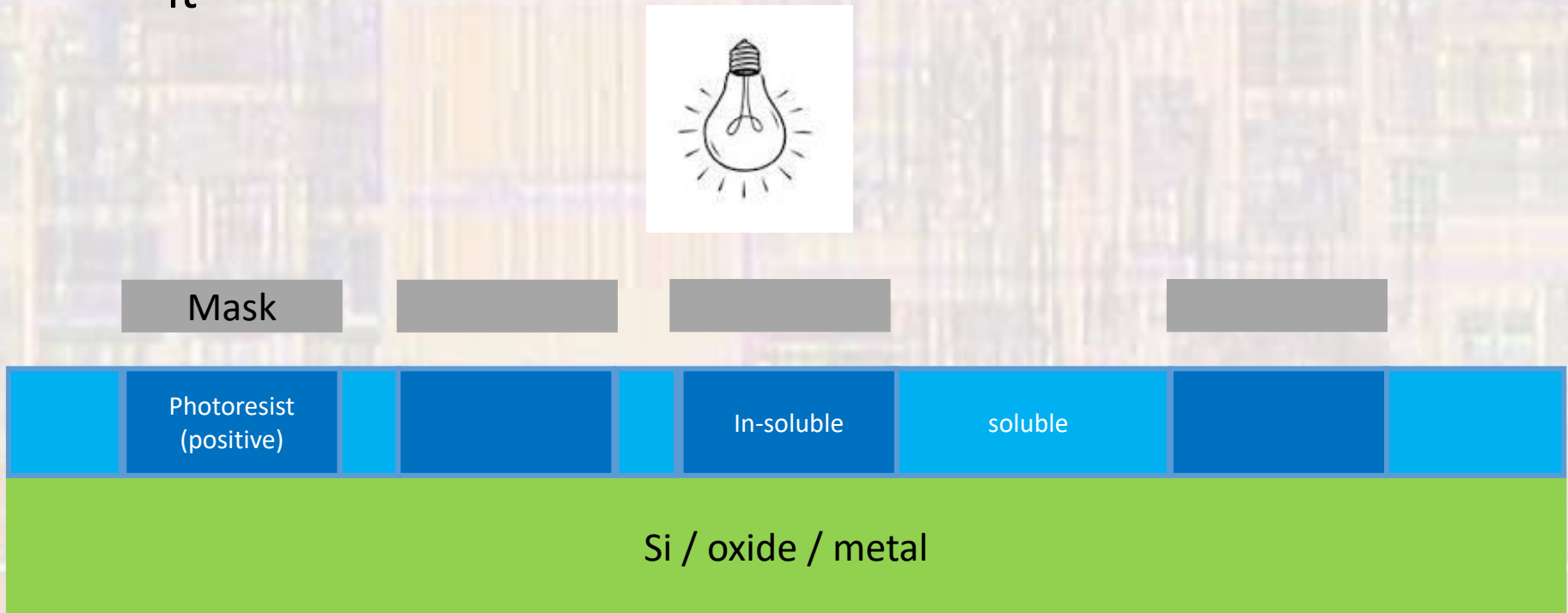
A cross-sectional diagram of a wafer during the lithography process. It consists of two horizontal layers. The top layer is blue and labeled 'photoresist'. The bottom layer is green and labeled 'Si / oxide / metal'.

photoresist

Si / oxide / metal

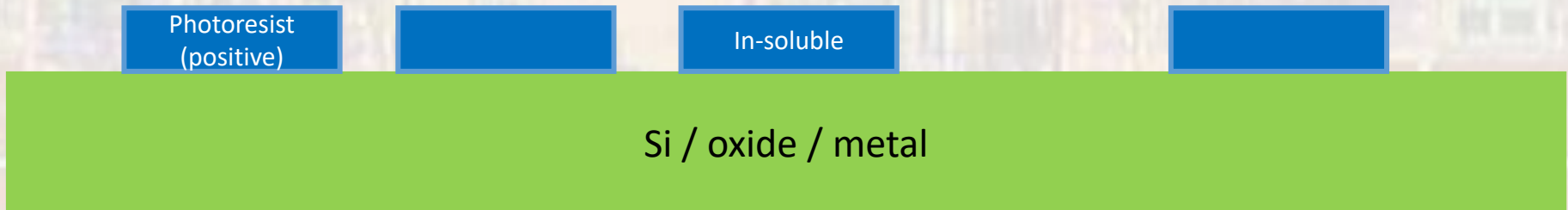
IC Lithography

- Shine light through a pre-patterned mask
 - Mask is not touching the wafer/photoresist
 - Positive resist becomes soluble when light is shined on it
 - Negative resist becomes in-soluble when light is shined on it



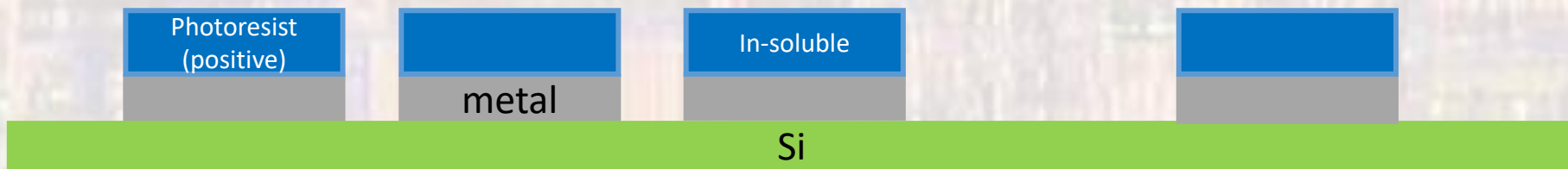
IC Lithography

- Wash the wafer with a solvent
 - Soluble resist is removed

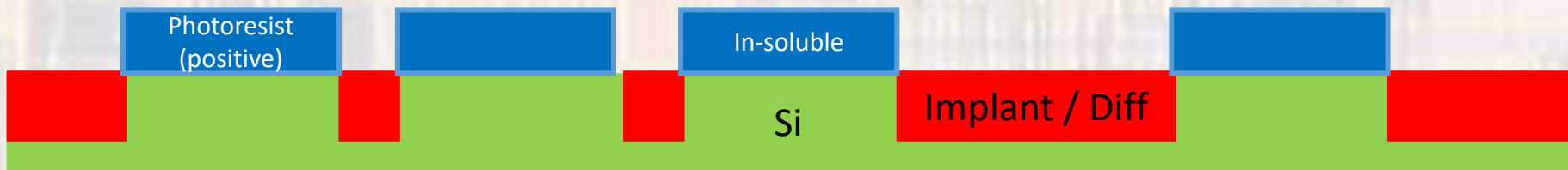


IC Lithography

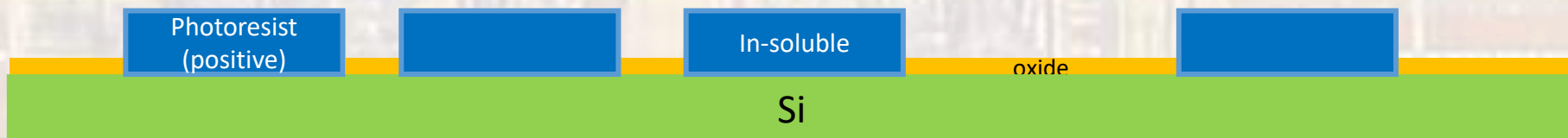
- Perform desired silicon processing
 - Photoresist acts like a mask on the wafer surface
- Etch



- Implant / Diffusion

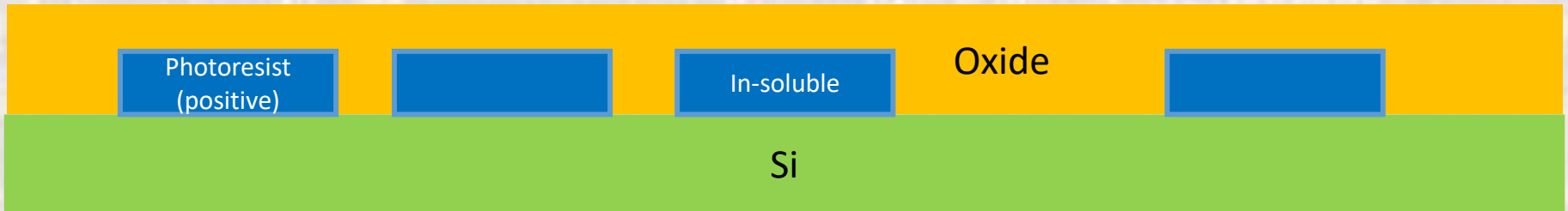


- Oxide growth

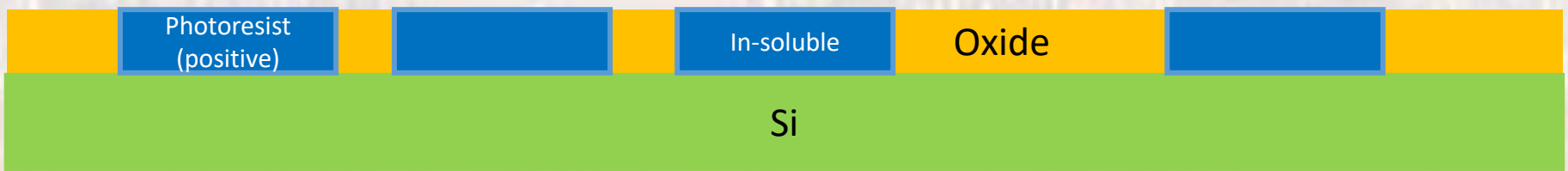


IC Lithography

- Perform desired silicon processing – cont'd
 - Deposition +

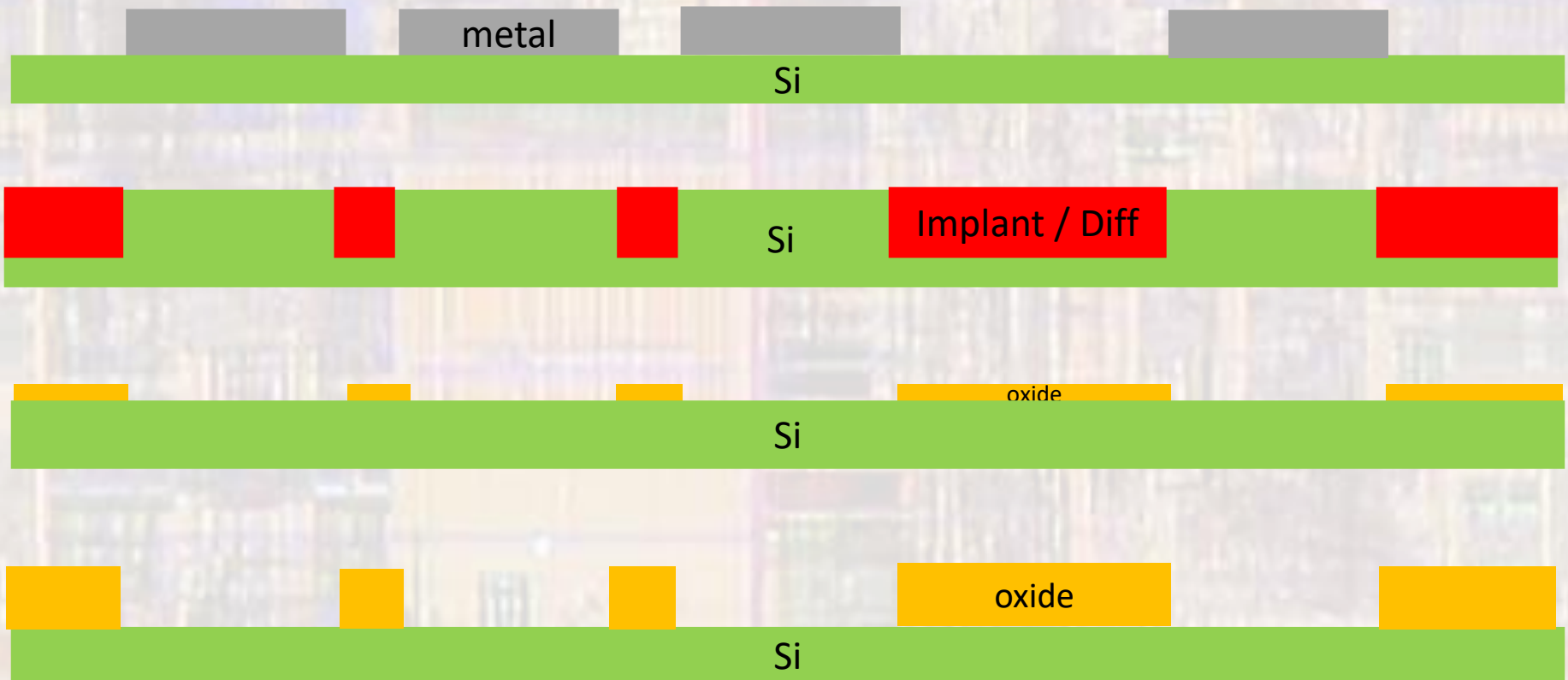


- Planarization



IC Lithography

- Remove photoresist
 - Use a solvent that removes all photoresist



- Start the next masking process