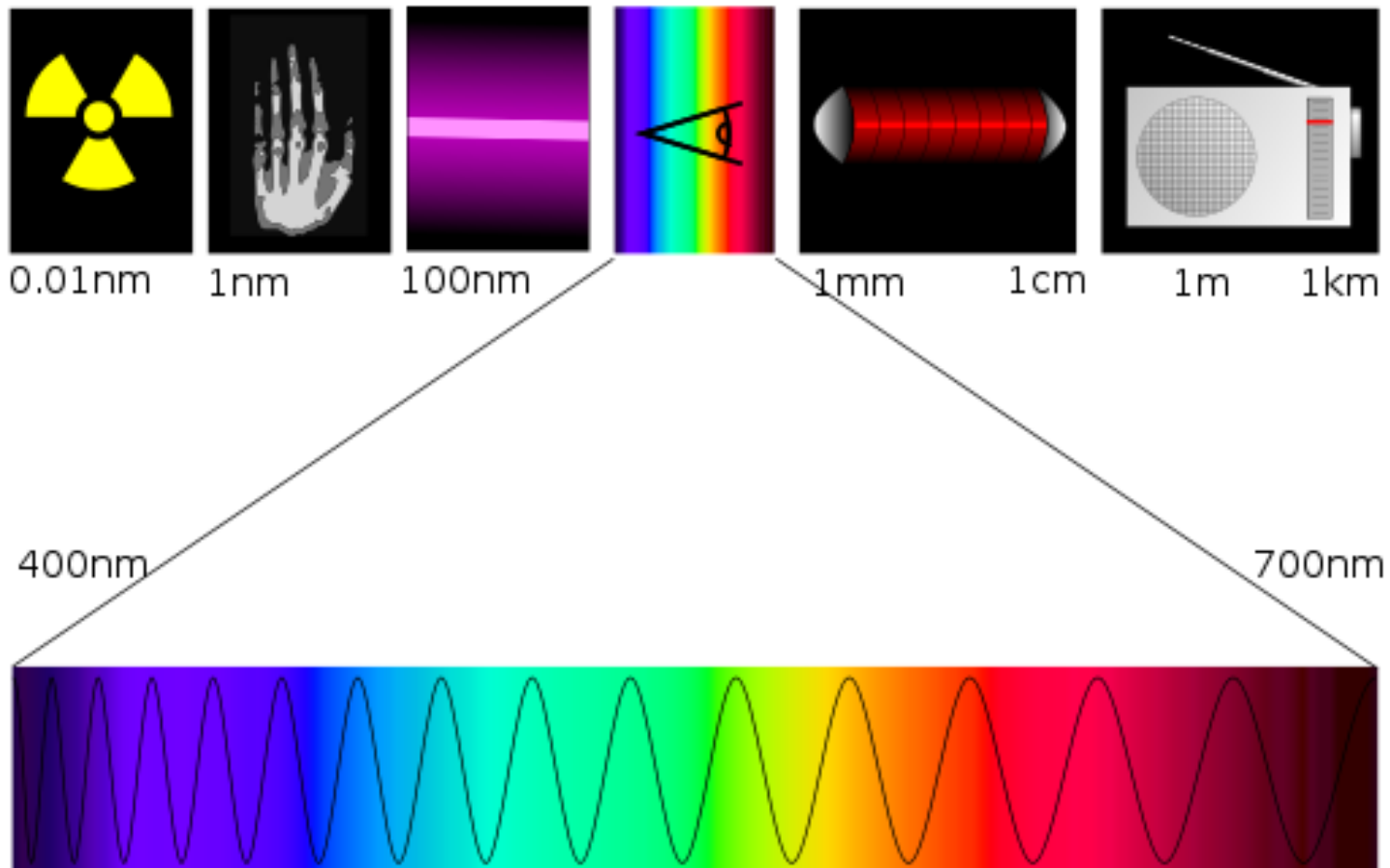


Lighting, Controls and Energy Savings

**How Architectural Engineers
Impact Building Energy Use**

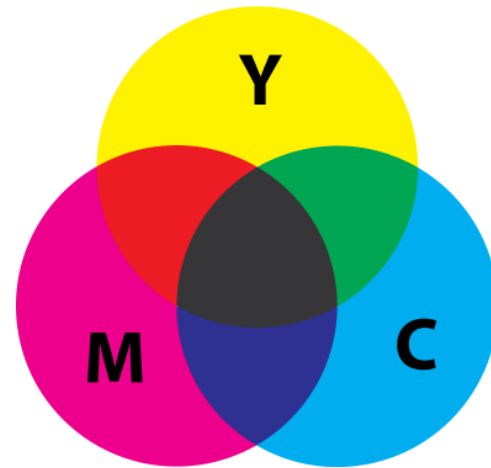
Visible Light



Visible Light

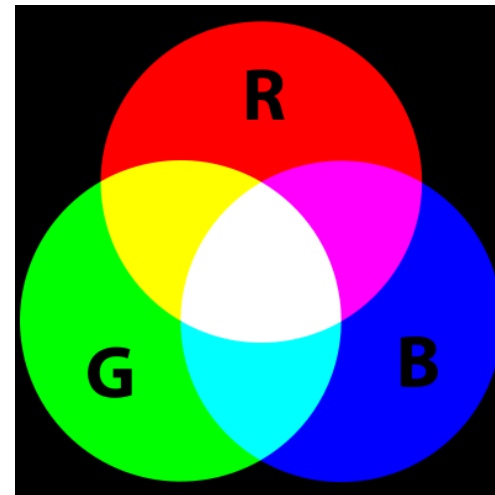
- Subtractive color mixing

➤ Paint or Ink →



- Additive color mixing

➤ LIGHT! →



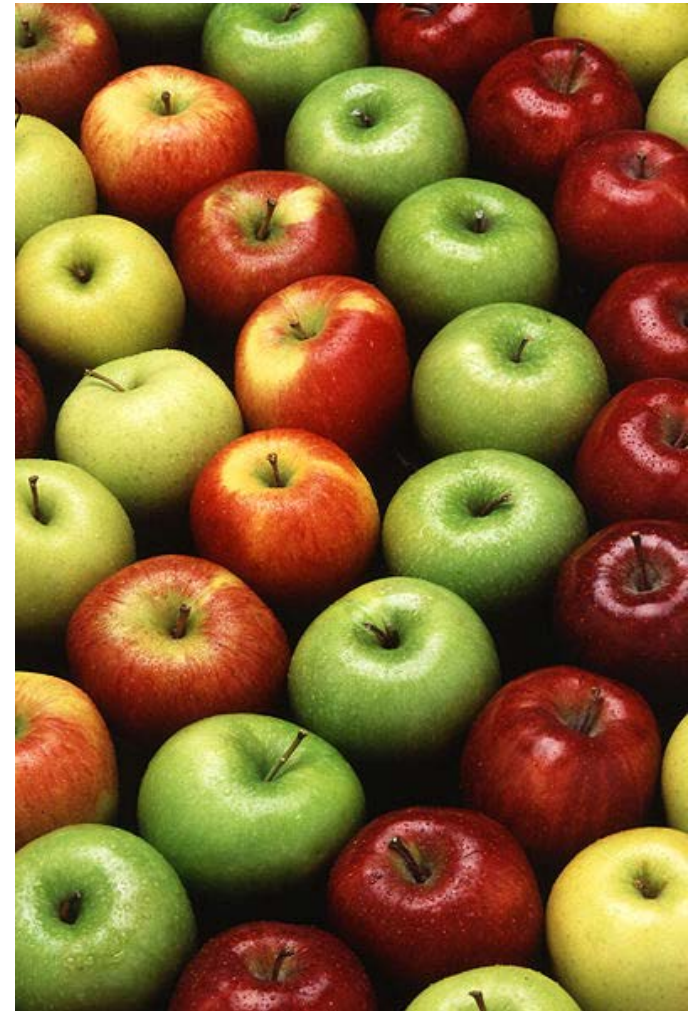
Light Source Technology

Did you know? Sunlight has all colors of the rainbow and appears WHITE



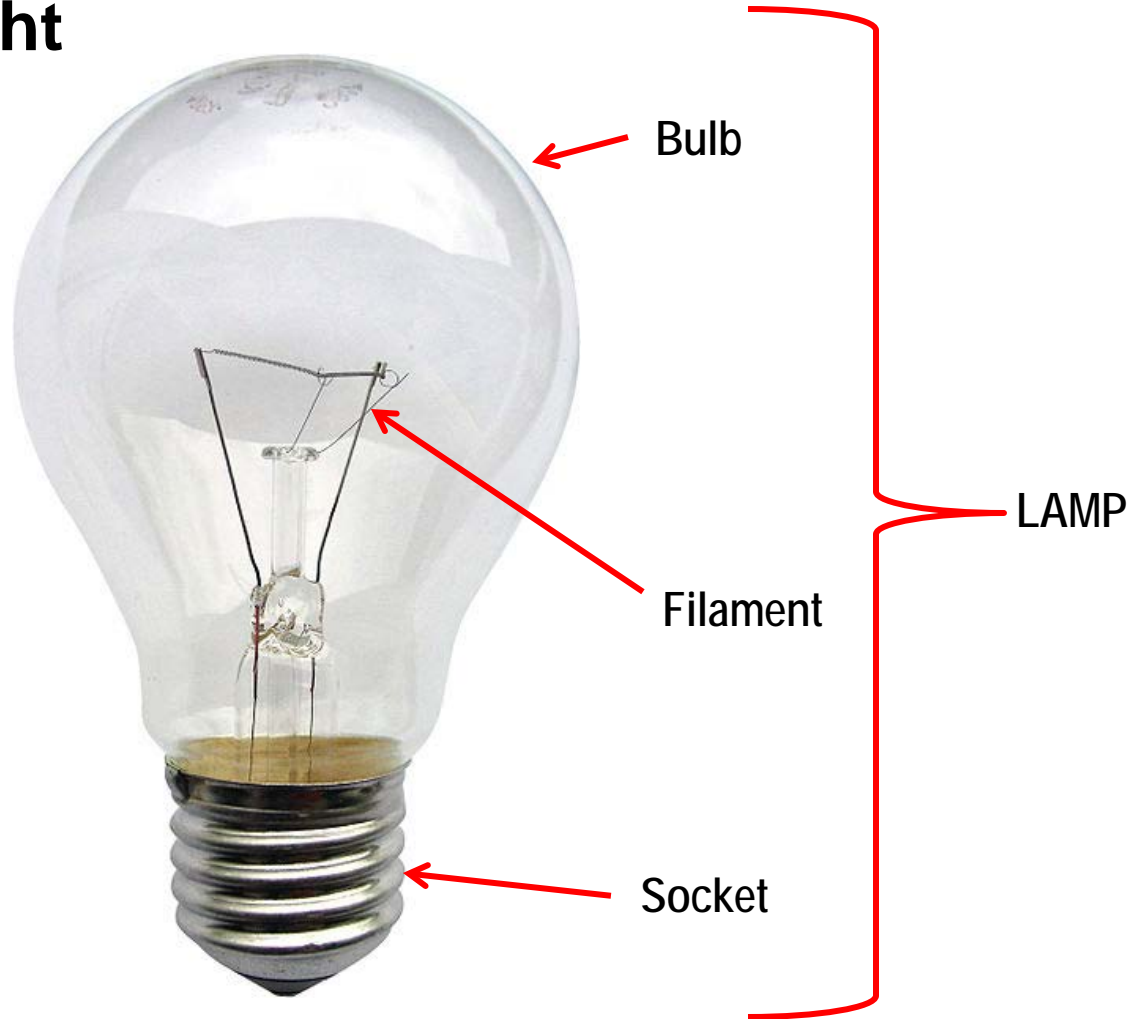
Visible Light

- Reflected light is what we “**SEE**”
- The **RED** apple is red because it absorbs all light except **RED**
- The **GREEN** apple is green because it absorbs all light except **GREEN**



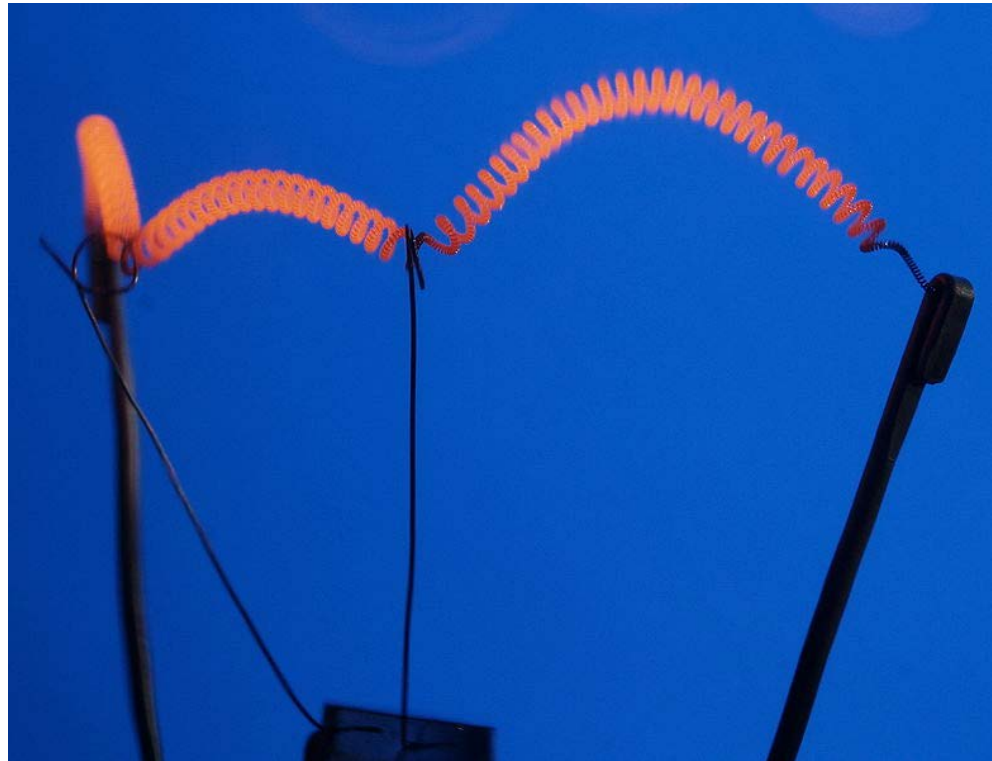
Light Source Technology

Electric Light



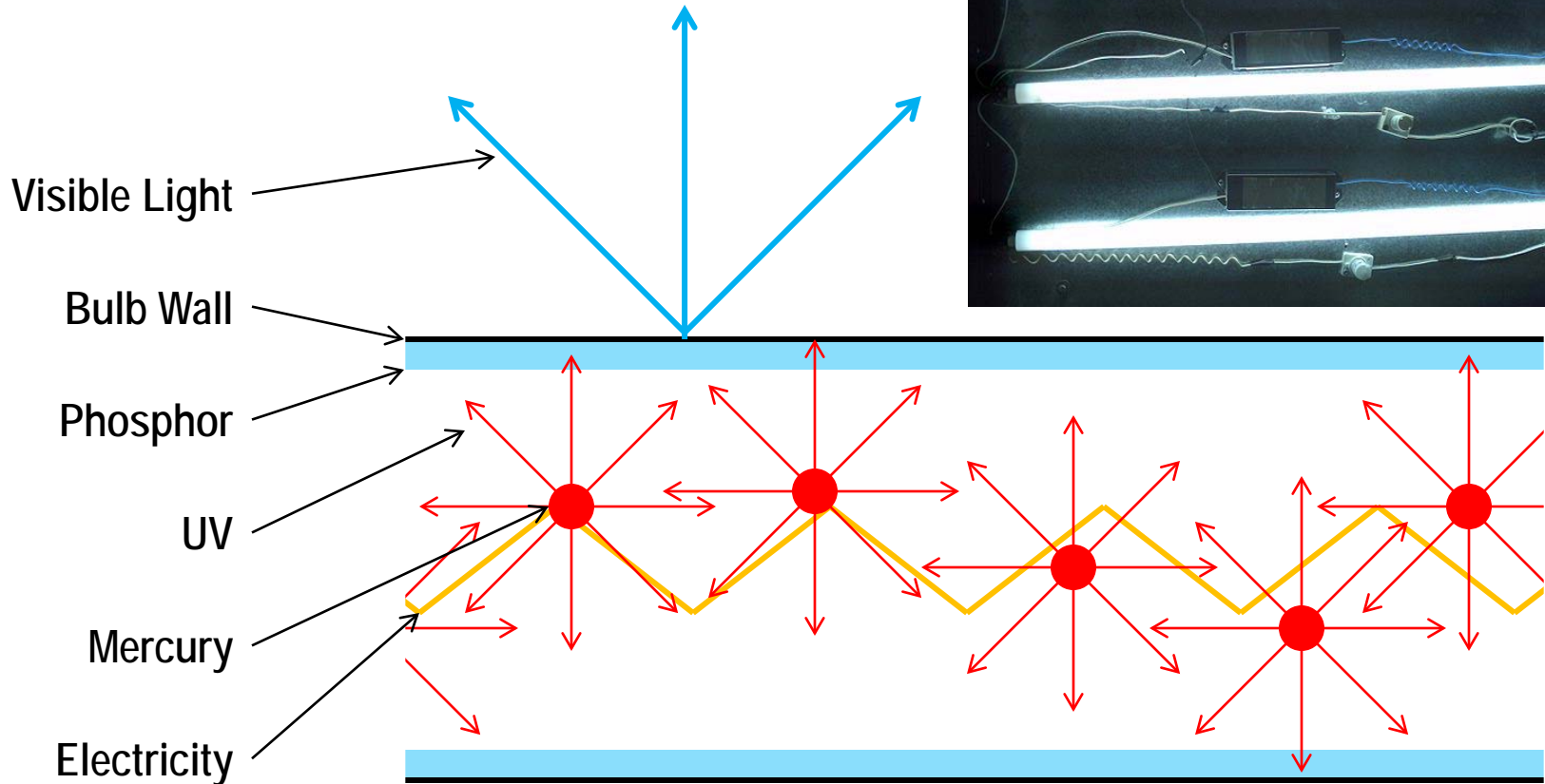
Light Source Technology

Incandescent Light



Light Source Technology

Fluorescent Light



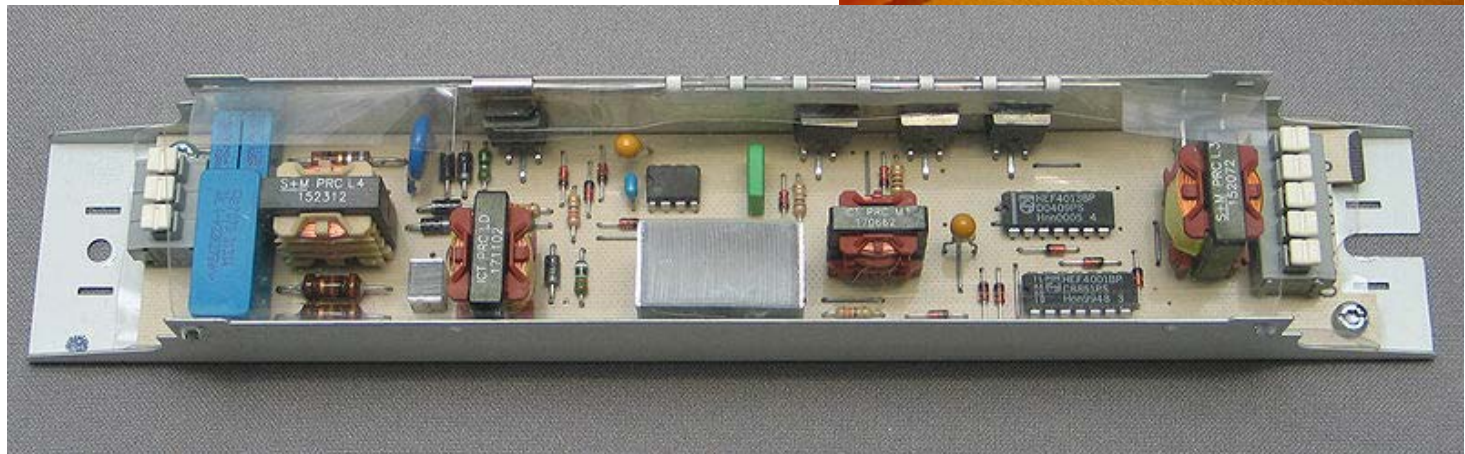
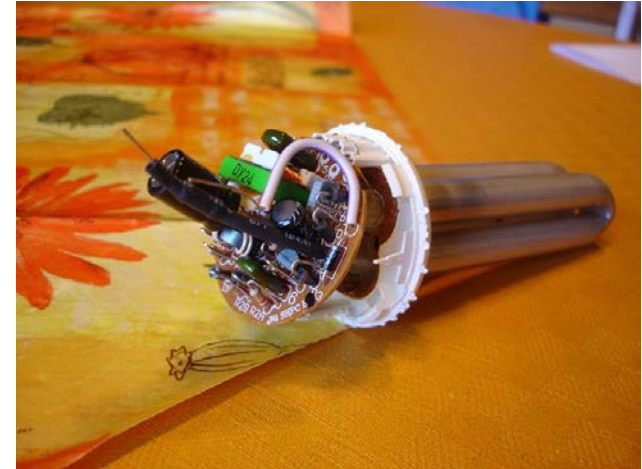
Light Source Technology

Compact Fluorescent Lamps (CFLs)



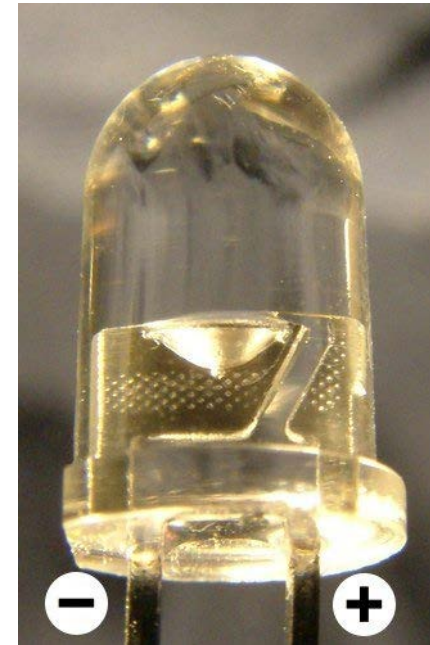
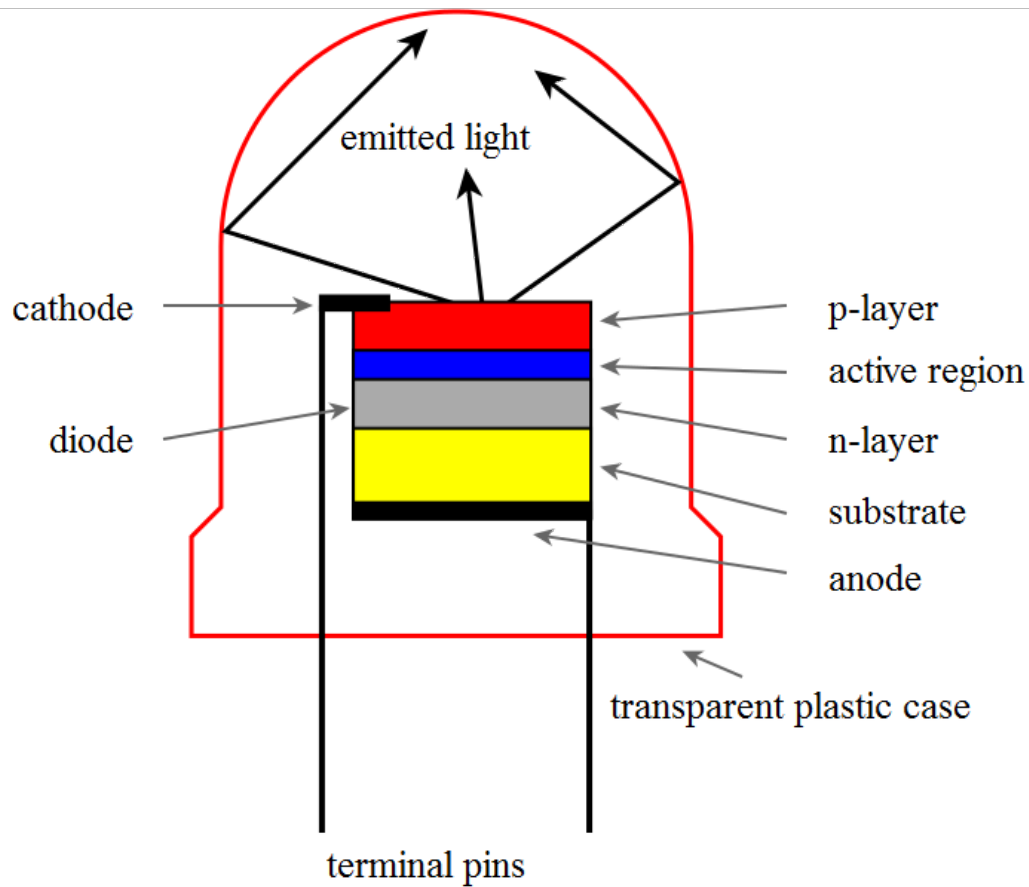
Light Source Technology

Fluorescent Ballast



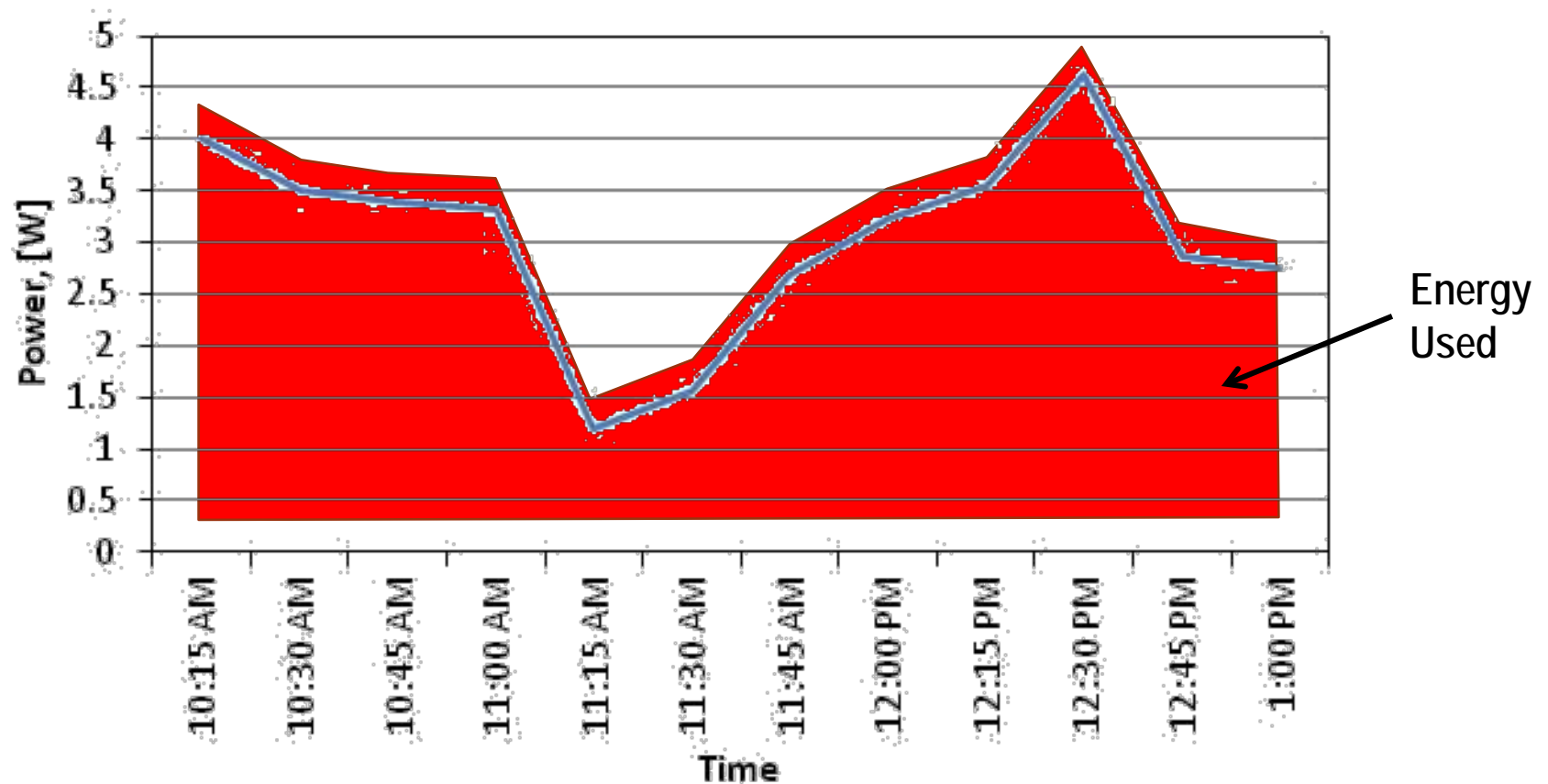
Light Source Technology

Light-Emitting Diodes (LEDs)



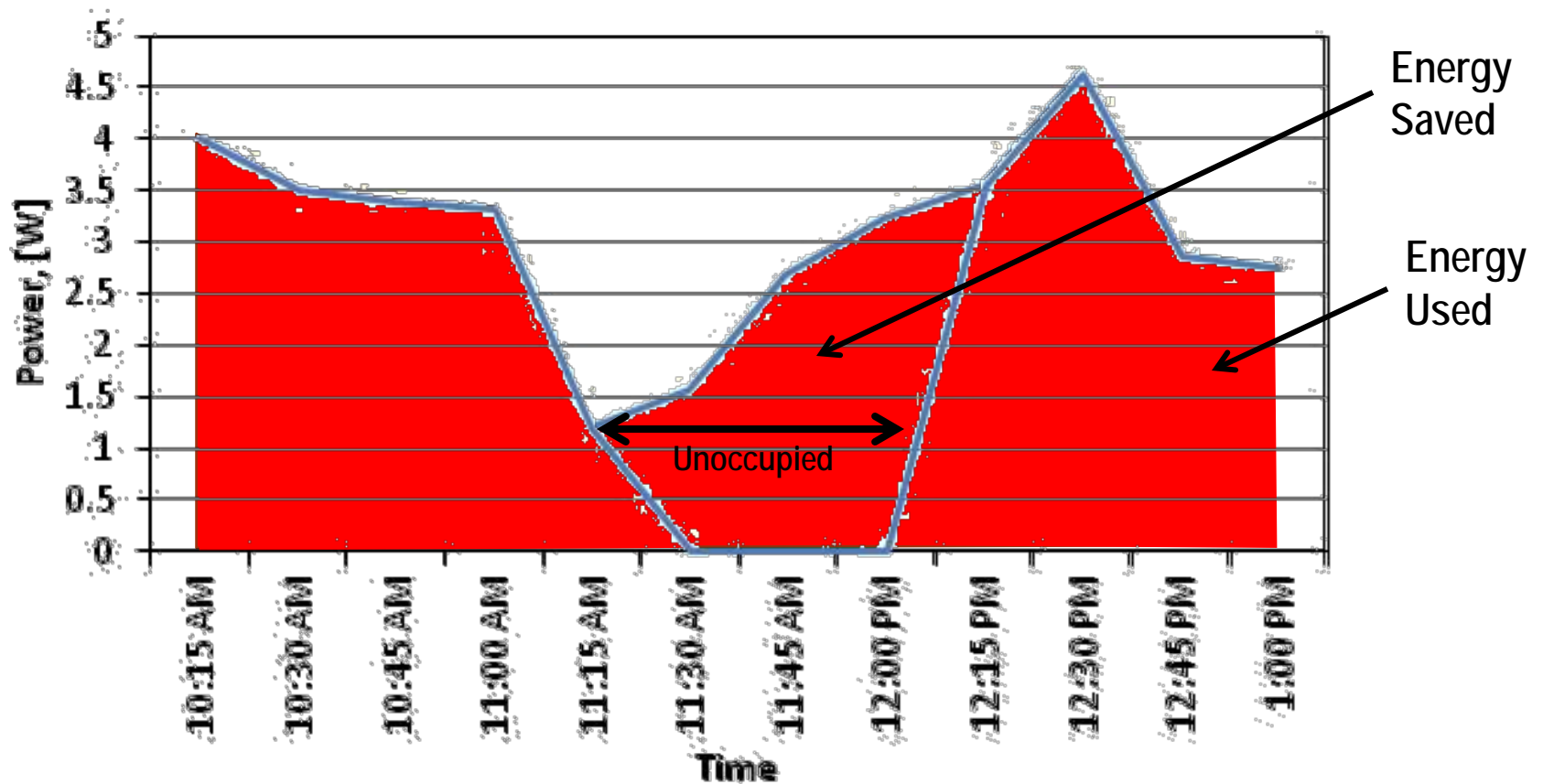
Lighting Controls

Power vs. Energy



Lighting Controls

Saving Energy through Occupancy Controls



Lighting Controls

Passive Infrared (PIR) Occupancy Sensors



Lighting Controls

Ultrasonic Occupancy Sensors



Lighting Controls

Daylighting



Lighting Controls

Photocell

