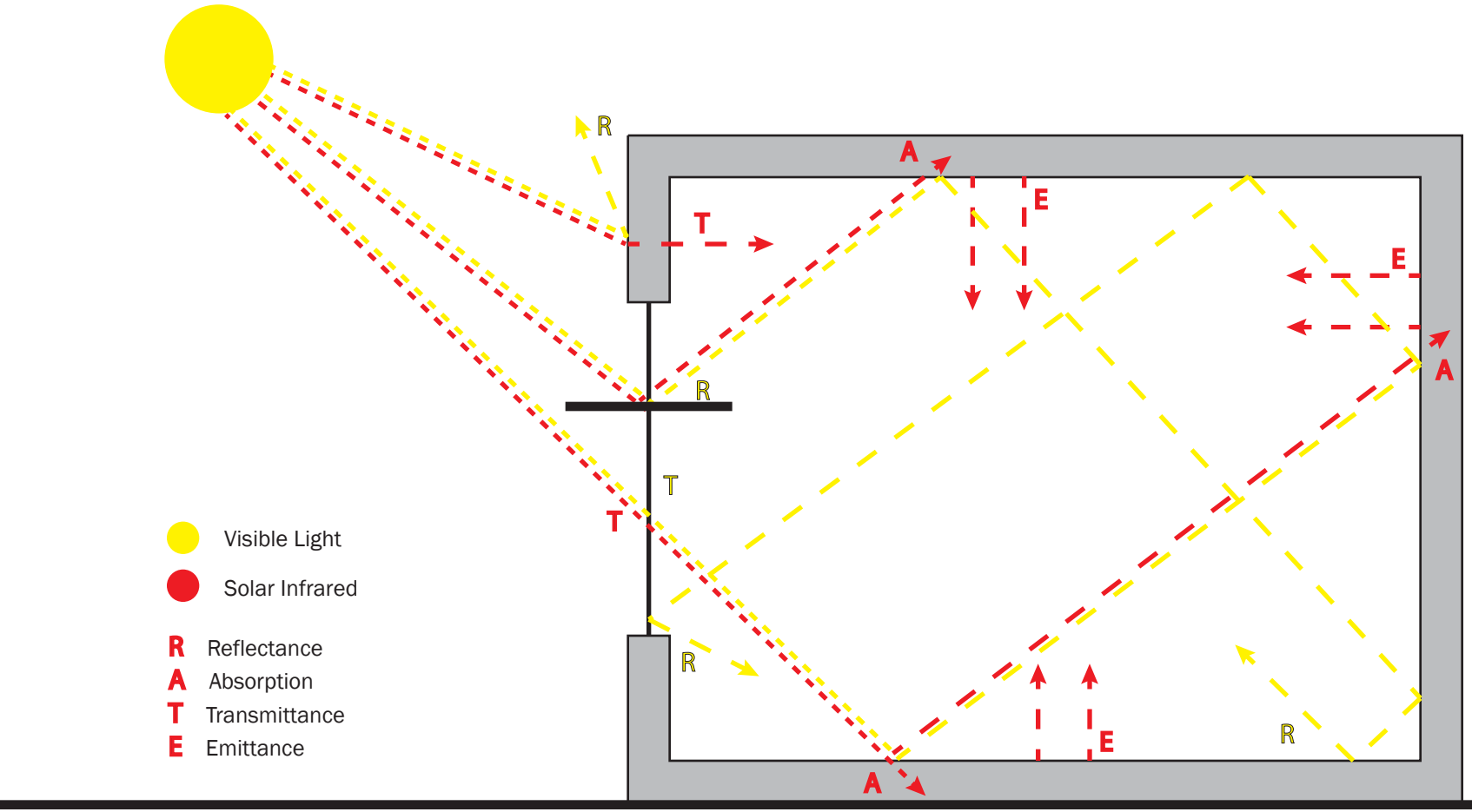
BEHAVIOR OF VISIBLE LIGHT

Janki A Vyas

ARCH 753

Building Performance Simulation



This diagram is showing how visible light and solar infrared light behaves when it hits the various surfaces within a room. When light passes through the window, assume a clear pane of glass is used with no coatings to block certain components of light, it will pass right through. Once it passes through, it will hit the horizontal surface of the room, the floor. Depending on the floor material and the reflective properties of the color, some of the light will be absorbed and stored as heat, while the rest will be reflected of the surface. Once the floor reaches its absorption capacity (or the indoor temperature is colder than the floor surface) the stored heat will be emitted back into the room. The reflected light can also be further absorbed/emitted by the wall surface and ceiling surfaces within the room. The degree to which these secondary surfaces absorb and emit heat into the space will vary depending on the shape of the room, surface materials and paint/finish colors. Dark colors will reflect less light and absorb more, whereas lighter colors will do the opposite. Furthermore, when and if visible light is reflected back towards the window, the wavelength is much longer and unable to pass through the window creating a greenhouse effect where the light waves are trapped within the space.