$$\vec{a} = (1,2,3)$$
  
 $\vec{b} = (4,5,6)$   
 $\vec{a} \cdot \vec{b} = 1.4 + 2.5 + 3.6 = 9 + 10 + 10 = 32$   
 $\vec{c} \cdot \vec{d} = 0$  Light  
 $\vec{c} \cdot \vec{d} = 0$  Surface  
 $\vec{c} \cdot \vec{d} = 0$  Surface